OIPE JC182
MAY 14 2004
PATENT & TRADEMARK OFFICE

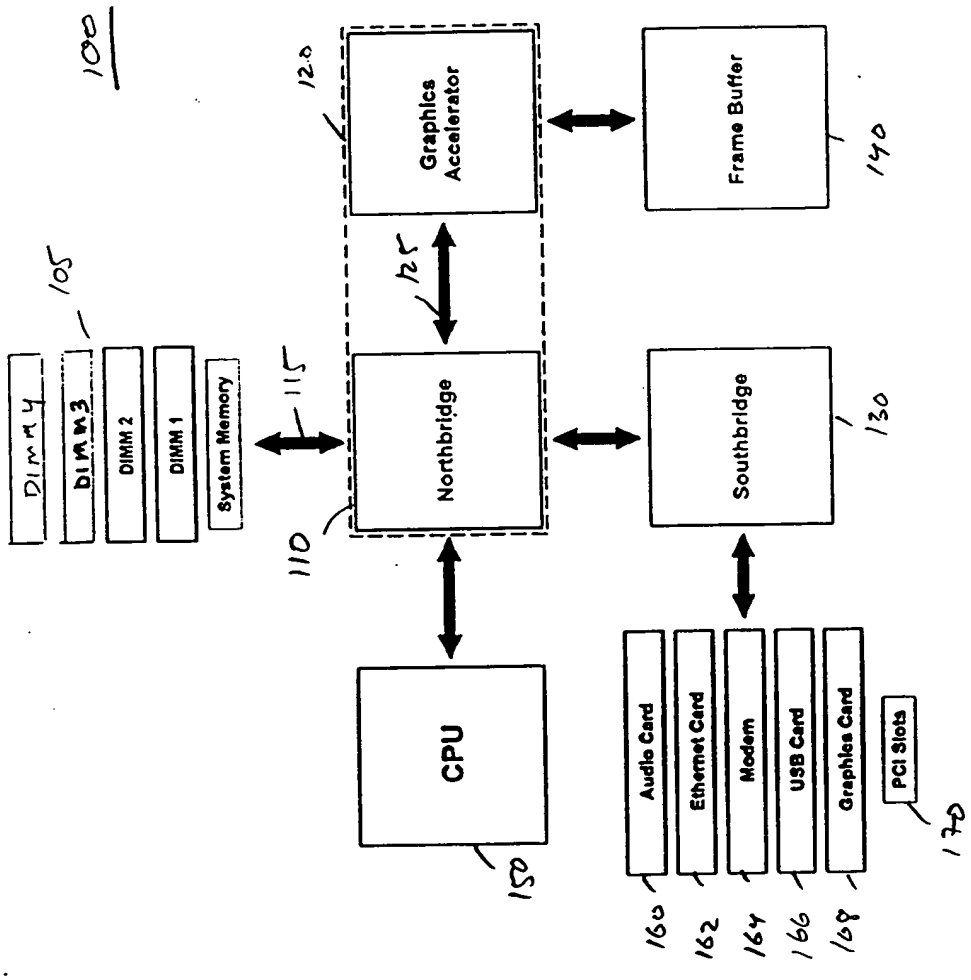


Figure 1

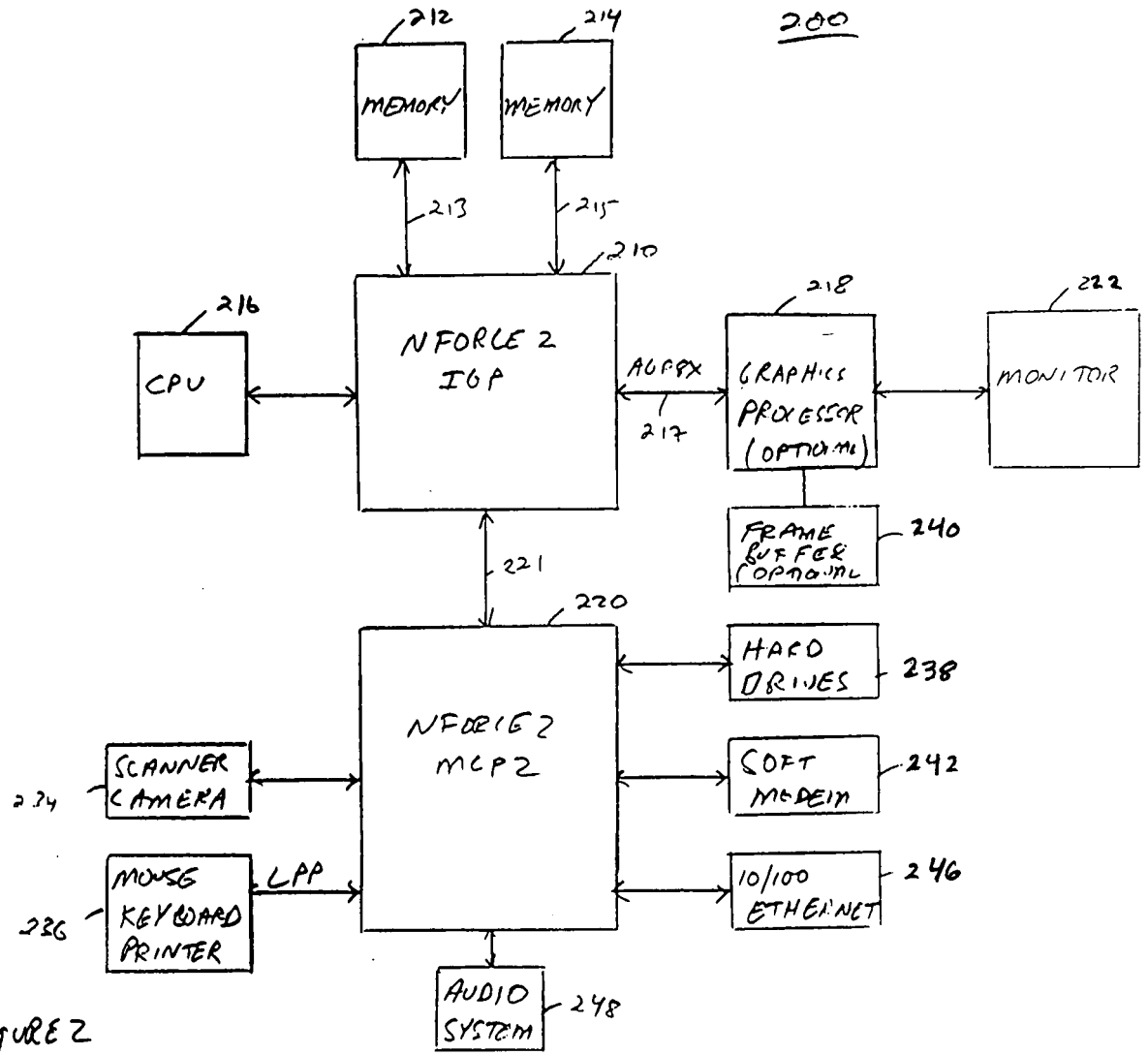
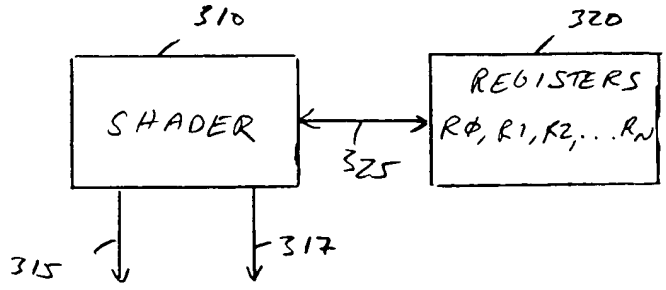

200
212
MEMORY
214
MEMORY
213
215
210
216
CPU
NFORCE 2
IGP
AGP8X
217
218
GRAPHICS
PROCESSOR
(OPTIONAL)
222
MONITOR
FRAME
BUFFER
(OPTIONAL)
240
221
220
NFORCE2
MCP2
HARD
DRIVES
238
SCANNER
CAMERA
224
SOFT
MODEM
242
MOUSE
KEYBOARD
PRINTER
226
LPP
10/100
ETHERNET
246
AUDIO
SYSTEM
248

Figure 2

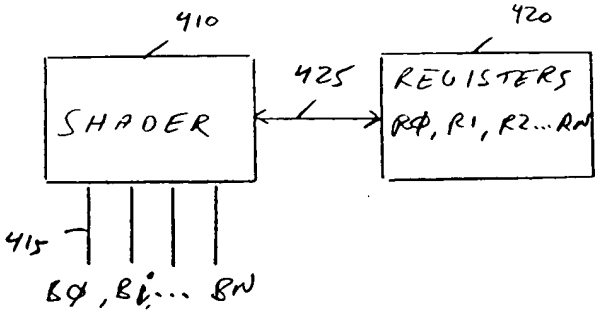


330 - MULT R0, R1, R2
335 - END

	340 ACTIVE CIRCUIT	350 ACTIVITY
342 -	REGISTERS	READ R1
344 -	REGISTERS	READ R2
345 -	SHADER	MULTIPLY R1 * R2
347 -	REGISTERS	WRITE R1 * R2 INTO R0
349 -	SHADER	WRITE R0 TO COLOR BUFFER

- PRIOR ART -

FIGURE 3



430 - MULT R0, R1, R2
440 - ADD R1, R0, R1
450 - END

MORE BUFFERS = MORE STEPS PER PASS + FEWER PASSES

	460 ACTIVE CIRCUIT	470 ACTIVITY
462 -	REGISTERS	READ R1
464 -	REGISTERS	READ R2
466 -	SHADER	MULTIPLY R1*R2
468 -	REGISTERS	WRITE R1*R2 INTO R0
472 -	REGISTERS	READ R0
474 -	REGISTERS	READ R1
476 -	SHADER	ADD R0+R1
478 -	REGISTERS	WRITE R0+R1 INTO R1
482 -	SHADER	WRITE R0 AND R1 INTO BUFFERS

FIGURE 4

```
510 - MULT   R0 , R1 , R2
520 - ST     R0 , #ZL
530 - ADD    R0 , R3 , R4
540 - LD     R1 , #ZH
```

```
550 - LD   R0 , #id          INDIRECT (FIXED)
552 - LD   R0 , @ R1         IDENTIFICATION (MOVABLE)
554 - LD   R0 , #address     DIRECT REFERENCE
556 - LD   R0 , @ R1         ADDRESS
```

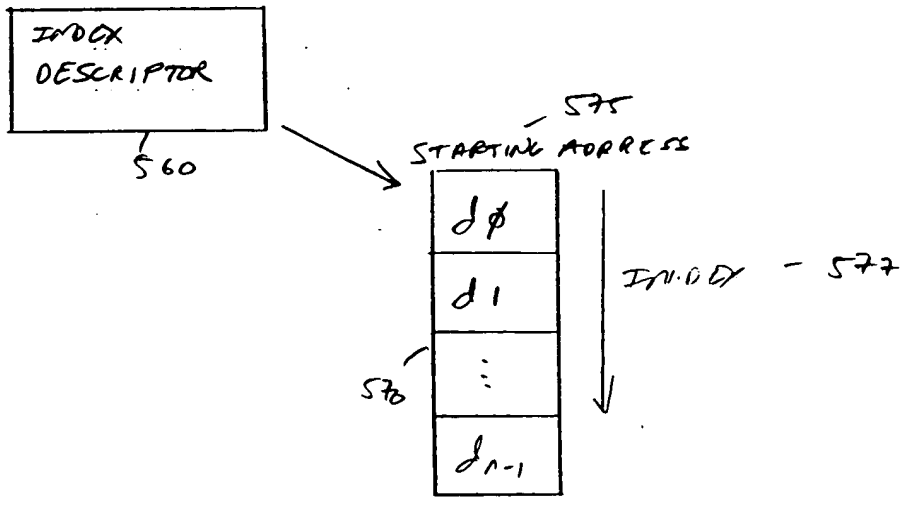
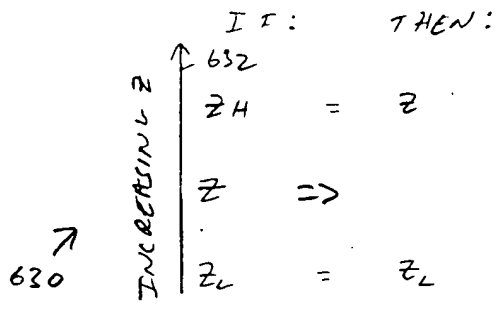
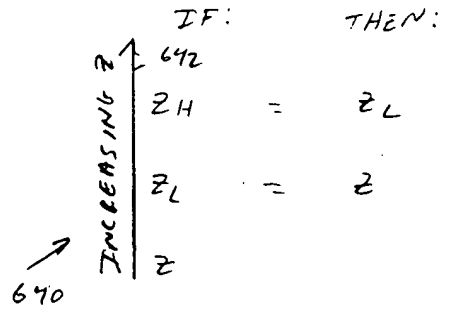


FIGURE 5

610 - IF ($Z_L < Z$ AND $Z < Z_H$) SET $Z_H = Z$

620 - IF ($Z <= Z_L$) SET $Z_H = Z_L$, SET $Z_L = Z$





COMMANDS (650)	R0 (670)	R1 (672)	R2 (674)	R3 (676)	Z_H (678)	Z_L (679)
652 - PLD R0, #Z_L	Z_L	-	-	-	Z_H	Z_L
654 - PLD R1, #Z_H	Z_L	Z_H	-	-	Z_H	Z_L
656 - LT R2, R0, Z	Z_L	Z_H	FALSE	-	Z_H	Z_L
658 - LT R3, Z, R1	Z_L	Z_H	FALSE	TRUE	Z_H	Z_L
660 - AND R3, R2, R3	Z_L	Z_H	FALSE	FALSE	Z_H	Z_L
662 - PSTC #Z_H, Z, R3	Z_L	Z_H	FALSE	FALSE	Z_H	Z_L
664 - PSTC #Z_L, Z, ~R2	Z_L	Z_H	FALSE	FALSE	Z_H	Z
665 - PSTC #Z_H, R0, ~R2	Z_H	Z_H	FALSE	FALSE	Z_L	Z

FIGURE 6

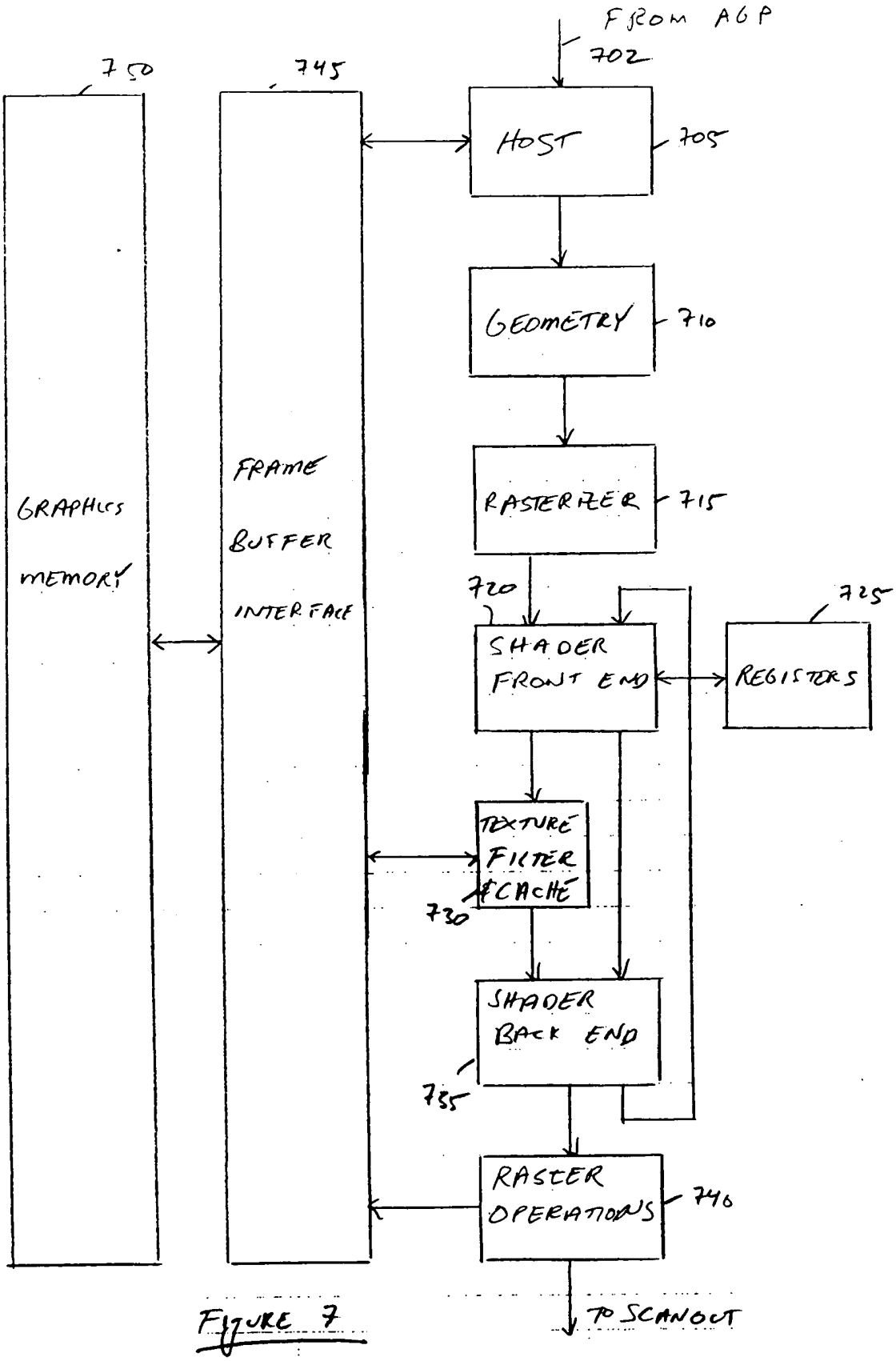

FROM AGP
702
750
745
HOST
705
GEOMETRY
710
RASTERIZER
715
GRAPHICS MEMORY
FRAME BUFFER INTERFACE
720
725
SHADER FRONT END
REGISTERS
TEXTURE FILTER CACHE
730
SHADER BACK END
735
RASTER OPERATIONS
740
TO SCANOUT

FIGURE 7